

AMENDMENTS TO THE SPECIFICATION:

Page 6, amend the paragraph beginning on line 23 to read as follows:

Q1
The hollow shape members (shown by the shaded portion of FIGS. 1 and 2) B 40B disposed at both longitudinal ends of the pair of side structures 10, the roof structure 20 and the underframe 30 constituting the car body are formed to have a different mechanical property from the hollow shape members A 40A constituting the center portion of the car body. The hollow shape members B 40B are formed of a material softer than the material of the hollow shape members A 40A, and the hollow shape members B 40B collapse easily when collision occurs, realizing a shock absorbing mechanism. The cross-sectional shapes of the hollow shape members A 40A and B 40B are the same. The ends of the car body on which the hollow shape members B are equipped constitute the passenger room (including the bathroom, the lavatory, the crew's room, etc.).

Page 7, amend the paragraph beginning on line 10 to read as follows:

Q2
The center sills 36 and the side sills 31 within the area of the end of the car body where the hollow shape members B 40B are equipped are also formed to collapse easily by impact force, similar to the hollow shape members B 40B. The upper plate and the side plates of the center sills 36 within range B 40B are provided with long holes 36b. Each center sill 36 has a channel-like cross-sectional shape with no bottom plate. Each side sill 31 within range B 40B is provided with long holes 31b, 31c, 31d, 31e, 31f formed to the face plates (face plates facing the inner side of the car body) excluding the side face plate facing the exterior of the car body. The reason for not providing the long hole to the exterior-side face plate is to prevent deterioration of appearance. Further, a thin plate (not shown) is welded to the long

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holes 31e and 31f exposed to the exterior of the car body to shut the opening of the long holes. This is to prevent water from intruding the inner side of the side sills.

Page 7, amend the paragraph beginning on line 26 to read as follows:

Q3
The hollow shape members constituting the side structures 10, the roof structure 20, and the underframe 30 of the car body comprise hollow shape members B, B-40B, 40B disposed at both longitudinal end portions, and hollow shape members constituting the other areas (the center area). The length of the hollow shape member B-40B can be, for example, about 100 to 500 mm. The hollow shape member B-40B is softer than the hollow shape member-A 40A. The hollow shape member B-40B is softened by annealing.

Page 8, amend the paragraph beginning on line 8 to read as follows:

Q4
This annealing can be, for example, an O-material treatment (O: temper of annealed metal). In general, various heat treatments are provided to the extruded shape member after the extrusion. If the material of the extruded shape member is A6N01, an artificial aging and hardening process of T5 is performed. The annealing of the O-material is performed thereafter. The annealing treatment to the O-material is performed for two hours at 380 °C, and the strength is 36.8 MPa. T5 has a strength of 245 MPa. The annealing of the O-material is meant to soften the hollow shape member. The elongation of the hollow shape member B-40B is greater than that of the hollow shape member-A 40A. The strength of the hollow shape member B-40B is smaller than that of the ~~hollow shape member-A~~ hollow shape member 40A. In order to provide necessary strength and softness to the member, annealing other than the O-material treatment can also be performed.

Page 8, amend the paragraph beginning on line 23 to read as follows:

as
The above-mentioned heat treatment can be performed after cutting the hollow shape member ~~B-40B~~ to the desired length as shown in FIG. 4, or can be performed while the hollow shape member is still long (not cut). When the hollow shape member is long, the member is cut to the predetermined length (~~B, B~~) (40B, 40B) after the heat treatment.

Page 9, amend the paragraph beginning on line 3 to read as follows:

ac
The hollow shape member ~~A-40A~~ and hollow shape members ~~B, B-40B, 40B~~ treated as explained above are welded together by welding W_1 , to form a hollow shape member 40 having a length corresponding to the total length of the car body. The hollow shape members 40 manufactured accordingly are arranged side-by-side in the width direction (circumferential direction of the car body) as shown in FIG. 5, and they are welded together in the conventional way by welding W_2 , thus forming the underframe 30, the side structures 10 and the roof structure 20. When forming the underframe 30, connecting members such as the side sills 31, 31 and the center sill 36 etc. are welded. The number of hollow shape members 40 appearing in FIG. 1 is different from the number of hollow shape members 40 in FIG. 5, since the number of members 40 in FIG. 1 is reduced so as to simplify the drawing.

Page 9, amend the paragraph beginning on line 17 to read as follows:

an
The welding between hollow shape members ~~B-40B~~ and hollow shape member ~~A-40A~~ is explained with reference to FIGS. 6 and 7. As known widely, the hollow shape member 40 (~~A, B~~) 40 (40A, 40B) comprises two face plates 41 and 42,

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contd

and connecting plates 43 for connecting the face plates 41, 42. The connecting plates 43 are slanted, and the slanted plates 43, 43 are arranged in trusses. In some cases, at the end portion where one hollow shape member 40 is welded onto another hollow shape member 40, the plate connecting the two face plates 41, 42 is not slanted but is orthogonal to the face plates 41, 42.

Page 10, amend the paragraph beginning on line 1 to read as follow:

28

The ends of hollow shape members A-40A and B- 40B can fit into one another. At the longitudinal ends of the hollow shape member-A 40A, the face plates 41 and 42 are removed by a cutting process so that the plural slanted members (connecting plates) 43 protrude therefrom. On the other hand, the hollow shape member B-40B is formed so that plural slanted members 43 are removed at the end region. The slanted members 43 protruding from the end of the hollow shape member A-40A can be inserted to the space between the two face plates 41, 42 of the hollow shape member-B 40B. After the members A-40A and B-40B are fit into one another, the face plates 41 and 41 (42 and 42) are welded together from the outer side. Since the members are fit into one another before the welding, the occurrence of bend or bump at the joint is suppressed, and the welding procedure can be performed with ease.

Page 10, amend the paragraph beginning at line 15 to read as follows:

29

Next, another method of manufacturing the car body is explained with reference to FIG. 10. A hollow shape member having a length corresponding to the whole length of the car body is used, without separating the length of the member into plural parts. The two end areas in the long hollow shape member are heat-

Q 9
treated (annealed) as it is to create portions B-40B having predetermined lengths. Possible methods for this heat treatment can include a method for partially heating the long hollow shape member inside a heating furnace, or a method performing high frequency hardening and the like where the hollow shape member is partially heated to obtain the desired property. After forming the hollow shape member having a length corresponding to the total length of the car body as mentioned above, the plurality of members are welded together to form the underframe.

Page 11, amend the paragraph beginning on line 13 to read as follows:

Q 10
Since the end portion of the car body is constituted of hollow shape members B-40B formed softer than the hollow shape members A-40A disposed at the center area of the car body, when impact occurs, the hollow shape members B-40B deform faster than the other portions constituted by hollow shape members A-40A of the underframe, relieving the shock of the impact. Since the center sills 36 and the side sills within the range of hollow shape member B-40B are provided with holes to help ease deformation, the sills deform similarly when impact occurs, allowing the hollow shape members B-40B of the underframe 30 to deform. Moreover, the side structures 10, 10 and the roof structure 20 deform similarly as the underframe 30 since the end portions thereof are formed with soft hollow shape members-B 40B.

Page 11, amend the paragraph beginning on line 26 to read as follows:

Q 11
The soft hollow shape members B-40B are disposed at the ends of the car body. This end position is defined as the area between the end beam 39 and the portion where the center sills 36 gain height (the portion near member 38 for the coupler). This area is thus determined considering the influence to the passengers

Q11
Q12

and crew within the car body. Since lavatories and equipment exist at the ends of the car body, and since the end portion takes up very little of the whole car body, influence to the passengers is relatively small. Moreover, the above-mentioned end range is determined so that if the car-end compressive load acting normally on the car body is applied, only small burden share is provided to this end range, and it will not influence the strength of the whole car body greatly. The length of each hollow shape member B-40B is within the range of about 100 to 500 mm, and falls within the above-mentioned range.

Page 12, amend the paragraph beginning on line 15 to read as follows:

Q12

The shock absorbing property of the hollow shape member B-40B will now be explained. Normally, when compressive load is applied to a conventional material used for railway cars, the material shows a load-deformation behavior as shown in FIG. 11. Three possible types of material characteristics are considered as shown in FIG. 12, a material I having high strength (such as pull strength, yield strength) but small elongation (brittle), a material III having less strength but better elongation, and a material II having a property intermediate those of materials I and III. The material shown by the curve X (X_1 , X_2) of FIG. 11 (the material corresponding to strength property I of FIG. 12) has better withstand load, but the withstand load drops rapidly after the value exceeds the maximum load. On the other hand, when the material has low strength and high elongation (the material corresponding to strength property III of FIG. 12), the maximum withstand load is smaller but the withstand load does not drop rapidly after the maximum value, as shown by the curved line Y of FIG. 11.

Page 14, amend the paragraph beginning on line 5 to read as follows:

Q13
When such material is used, the hollow shape member B-40B deforms and collapses before the other portions A-40A of the hollow shape members, relieving the impact loaded to the car body. Moreover, since the member B-40B is made of a hollow shape member, in comparison to the general thin-plate structure, the member has higher inner-plate and outer-plate flexural rigidity, and since it has a composite structure including two face plates and cross (slanted) plates, it has higher breaking-energy absorption property against compressive load (per unit planar area).

Page 14, amend the paragraph beginning on line 14 to read as follows:

Q14
Though the hollow shape member B-40B is positioned within the passenger room, but it is disposed at the end of the car body, so the influence to the passengers is considered to be small.

Page 14, amend the paragraph beginning on line 17 to read as follows:

Q15
The ends of the center sills 36 and the side sills 31 can also be softened by heat treatment similar to the hollow shape member-B 40B. In such case, the end portion and the center portion of the member can either be formed of one member or be formed by welding plural parts together. If hollow shape members are used, the parts are fit to one another as explained earlier.

AMENDMENTS TO THE DRAWINGS:

The attached sheets of drawings include the sheets having Figs. 1, 2, 4, 5, 6, 7 and 10. In these drawing figures, reference numbers A and B respectively have been changed to "40A" and "40B"; and, moreover, reference character B₁ has been changed to reference number B in Fig. 1.

Attachment:

Replacement sheets